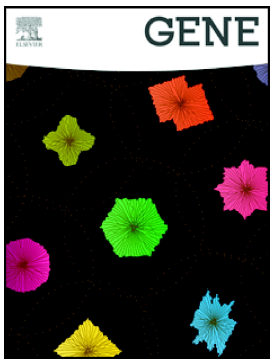

Identification on novel locus of dairy traits of Kazakh horse in Xinjiang

Ling-Ling Liu, Chao Fang, Wu-Jun Liu

PII: S0378-1119(18)30778-9
DOI: doi:10.1016/j.gene.2018.07.009
Reference: GENE 43050

To appear in: *Gene*

Received date: 3 April 2018
Revised date: 21 June 2018
Accepted date: 2 July 2018

Please cite this article as: Ling-Ling Liu, Chao Fang, Wu-Jun Liu , Identification on novel locus of dairy traits of Kazakh horse in Xinjiang. Gene (2018), doi:10.1016/j.gene.2018.07.009

Identification on novel locus of dairy traits of Kazakh horse in Xinjiang

Ling-Ling Liu [a], Chao Fang [a], Wu-Jun Liu [a, *]

[a] Xinjiang Agricultural University, Urumqi, Xinjiang 830052, China

ABSTRACT

The utility of high-density single nucleotide polymorphism (SNP) data help to accurately identify genomic regions that have undergone positive selection. In this study, the Affymetrix Equine 670K high-density SNP array was used to genotype Kazakh and Yili horse population. After quality control, 370,227 autosomal SNPs were used to detect selection signatures by using global fixation index (F_{ST}) and cross-population extended haplotype homozygosity (XP-EHH). The database of Ensemble, Genecards, and NCBI were used to make gene annotation and functional analysis. The results showed that there were 134 candidate SNPs overlapped between F_{ST} and XP-EHH in Kazakh horse. We also discovered some potential selective sweep regions associated with milk trait, including NUMB, *LGALS2*, *ADCY8*, *SLC25A30*, and *CA8* genes. New findings from this research has potential value for milk traits selecting in horse.

Keywords: F_{ST}; XP-EHH; selection; Kazakh horse; Yili horse

Correspondence

Wu-Jun Liu, Xinjiang Agricultural University, Xinjiang, China.

Emails: lwj_ws@163.com

1. Introduction

Domestication is a long-term process for animal adapting to environment, artificial selection can render tremendous changes to animal behavior, body size, and some important traits together with domestication progress [1-2]. Horse were domesticated approximately 5,000 years ago [3-5]. In the past 400 years, the founding of formal breed registries and subsequent breed specialization has focused more upon preserving and improving traits related to aesthetics and performance [6]. With the rapid development of society, the use of horses for transportation, warfare, and agriculture has resulted in diverse populations distributed across the world. The racing line of Quarter horse was characterized by great sprinting speed over short distances on straight tracks [7]. Swedish warmblood riding horses were used for riding, and 4-year-old horses of both genders could